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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,963	02/14/2002	Stanford W. Crane JR.	9161.018.00-US	8319

30827 7590 05/11/2004

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EXAMINER	
STAHL, MICHAEL J	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 05/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/073,963	CRANE ET AL.	
	Examiner	Art Unit	
	Mike Stahl	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1-82 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-13,15-26,30-39,41-44,46,47,49,50,53-66,68-74,76,77 and 80-82 is/are rejected.

7)☒ Claim(s) 14,27-29,40,45,48,51-54,67,72,75,78 and 79 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 14 February 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/30/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the citizenship of each inventor; and

It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

The declaration is missing the above-noted information for inventors Jeon and Nickel.

Claim Objections

Claim 53 is objected to because it recites essentially the same invention as claim 38.

Claim 54 is objected to because it recites exactly the same invention as claim 39.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12, 15, 19, 64, 66, 80, and 81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 is indefinite because it refers to "said walls" but no walls are mentioned earlier in claim 12 or in parent claim 1.

Claims 15 and 19 are indefinite because they refer to "said optical input receptacle" but no optical input receptacle is previously recited in these claims or in parent claim 1. It is noted that this objection may be overcome by changing each of claims 15 and 19 to depend from claim 23.

Claims 64, 66, 80, and 81 are indefinite because they recite "said sheath" or "said inner conductor", neither of which is previously mentioned in these claims or in parent claim 56. It is noted that claim 56 does not contain details of the transmission line pins, such as the sheath and inner and outer conductors, which were recited in the other independent claims 1 and 30. Accordingly these rejections may be overcome by adding such details to claim 56.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4, 6-7, 9-10, 23, 30-31, 33, 35-36, 38-39, 47, and 53-54 are rejected under 35 U.S.C. 102(e) as being anticipated by Kuwahara et al. (US 6498294).

Claim 1: Kuwahara discloses a packaging assembly (figs. 3A-4) including: a cover (col. 3 lines 45-47); a submount **11** retaining a plurality of transmission line pins each including an inner conductor **14**, a dielectric sheath **15**, and an outer conductive shield **17**; and a base **12**, wherein the cover, submount and base mate to form a package for retaining an optoelectronic device (e.g. a photodiode or laser diode – col. 5 lines 60-67).

Claim 2: The transmission line pins have rectangular cross sections.

Claim 4: Kuwahara teaches that the package may be made from conductive plastic (col. 6 lines 1-6). It is known in the art that conductive plastic typically is made either from nonconductive plastic impregnated with conductive particles, or from nonconductive plastic which is coated with a conductive material. Therefore it is asserted that the conductive plastic referred to by Kuwahara would in practice include nonconductive plastic.

Claims 6-7: As asserted above the Kuwahara package in an alternative embodiment includes nonconductive plastic having a conductive coating. Since the outer conductive shield is mounted on the wall of the package, it would inherently be in electrical contact with the plastic in this embodiment.

Claims 9-10: Each of the pins includes both an inner portion and an outer portion each having an exposed inner conductor **14** (see e.g. figs. 3A or 8).

Claim 23: The package includes an optical input receptacle **13**.

Claim 30: The protruding portions **17** constitute barriers between adjacent transmission line pins.

Claims 31, 33, 35-36, 38-39, 47, and 53-54: These claims recite limitations which were already identified in Kuwahara above.

Claims 56, 59, 65, and 73-74 are rejected under 35 U.S.C. 102(b) as being anticipated by Makiuchi et al. (US 5436997).

Claim 56: Makiuchi discloses an optoelectronic packaging assembly (fig. 15) including: a cover **57**; a submount **55** retaining a plurality of transmission line pins **56** extending from a cavity in the submount to the exterior of the submount; a base **60**; and an optoelectronic device (mounted on a support plate **59**) disposed between the submount and the base; wherein the cover, submount, and base mate to form a package for retaining the optoelectronic device and the pins conduct signals for the device.

Claim 59: At least some of the transmission line pins **56** bend to run alongside the base when the package is fully assembled. Note in particular the rightmost pin **56** in fig. 15.

Claim 65: Each of the plurality of pins **56** has an inner portion with an exposed inner conductor.

Claim 73: The base **60** (in fig. 15) includes a plurality of fins **61** covered with a conductive material.

Claim 74: The package includes an optical input receptacle for receiving an optical fiber **60**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 11-13, 16, 34, 41-44, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwahara et al. (cited above).

Claim 5: Kuwahara fails to disclose what type of polymer makes up the conductive plastic. Liquid crystal polymer is already known in the art. It would have been obvious to a skilled person to use any suitable polymer which meets the needs of a specific practical implementation of the Kuwahara package. A skilled person would recognize that liquid crystal polymers could be beneficially used in making the Kuwahara package since it is known that liquid crystal polymers are comparatively easy to mold (they have low melt viscosity) and offer good dimensional stability which can facilitate precise alignment of optical elements.

Claim 11: Kuwahara fails to specify the shape of the cover. Nevertheless it would have been obvious to a person of ordinary skill in the art to provide a cover having a cavity defined by sidewalls in order to physically accommodate a given component within the package.

Claim 12: Similarly, it would have been obvious to a skilled person to design the cover with any suitable shape, including one with beveled walls for various reasons, e.g. to correspond to the shape of an enclosed component, for esthetic purposes, to make the package easier to handle, and so forth.

Claim 13: Again the shape of the cover in Kuwahara is not specified. It would have been obvious to a skilled person to provide fins on the cover since this is a well known way of improving heat dissipation.

Claim 16: It was asserted above that plastic coated with conductive material is within the scope of Kuwahara. It would have been obvious to a skilled person to coat both the inner and

outer surfaces of the plastic, e.g. by electroplating, since to selectively coat either the inner surface or the outer surface would require an additional masking process.

Claims 34, 41, and 43-44: The limitations of these claims parallel those of various claims rejected above.

Claim 42: It would have been obvious to a skilled person to design the cover with any suitable shape, including one having a relief, for various reasons, e.g. to identify the location of an enclosed component, to provide space for attaching a label, and so forth.

Claim 46: The base **12** in Kuwahara is illustrated as being flat. However, it would have been obvious to a skilled person to furnish the base with fins in order to improve radiation of heat away from the package.

Claims 57-58, 60-63, 68-71, 76-77, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makiuchi et al. (cited above).

Claims 57-58: It is not clear what cross-sectional shape the pins **56** have. It would have been obvious to a person having ordinary skill in the art to provide pins having any suitable cross-sectional shape, including circular or square pins, as dictated e.g. by the shape of the external pin receptacles.

Claim 60: Makiuchi teaches that the package may be made from metal, ceramic, or other suitable materials so long as they are compatible with the materials of the optical device or optical fibers (col. 6 lines 27-32). It would have been obvious to a person having ordinary skill in the art to make the package from nonconductive plastic since plastic is generally easier to machine and cheaper than metal or ceramic and lends itself well to mass production by molding.

Claim 61: It would have been obvious to a skilled person to specifically use liquid crystal polymer since this has recognized advantages over other plastic materials which were noted above in relation to claim 5 as rejected under Kuwahara.

Claim 62: It would have been obvious to a skilled person to coat a Kuwahara package made from plastic with conductive material in order to provide shielding from external electromagnetic interference, particularly when the packaged device is a photodetector (note Kuwahara recognizes the need to shield photodetectors from even other electronic devices in the same package – col. 9 lines 37-43).

Claim 63: The conductive coating proposed above would constitute an outer shield and would be in electrical contact with the nonconductive plastic of the package.

Claim 68: It would have been obvious to a skilled person to form the cover **57** with fins in order to improve heat dissipation.

Claim 69: It would have been obvious to a skilled person to design the cover **57** with any suitable shape, including one having a relief, for various reasons, e.g. to identify the location of an enclosed component, to provide space for attaching a label, and so forth.

Claim 70: It would have been obvious to a person of ordinary skill in the art to provide cover **57** with a cavity defined by sidewalls in order to physically accommodate a given component within the package.

Claim 71: Similarly, it would have been obvious to a skilled person to design the cover **57** with any suitable shape, including one with beveled walls for various reasons, e.g. to correspond to the shape of an enclosed component, for esthetic purposes, to make the package easier to handle, and so forth.

Claims 76-77: Makiuchi does not disclose a thermoelectric cooler, but thermoelectric coolers are already well known in the art. It would have been obvious to a skilled person to provide a thermoelectric cooler in the Makiuchi package to further improve dissipation of heat away from devices such as **51** and **52**. It would further have been obvious to fit the thermoelectric cooler on the base, e.g. between the base and the devices **51/52**, since the base is already configured to act as a heat sink.

Claim 82: It would have been obvious to a skilled person to furnish the base with a flange having mounting holes in order to provide for detachable mounting to an external structure.

Claims 1-3, 8-10, 17-18, and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hokanson et al. (US 4873566).

Claim 1: Hokanson discloses a packaging assembly including: a cover (sealing layer **27**); a submount retaining a transmission line pin; and a base **26**; wherein the cover, submount and base mate to form a package for retaining an optoelectronic device **52**. Layers **18, 20,** and **22** together are regarded as a submount for purposes of this rejection. Hokanson discloses one form of transmission line pin associated with layer **20** (see e.g. fig. 3) but also teaches an alternative pin structure including an inner conductor disposed in a dielectric material and further surrounded by conductive plates (col. 4 lines 34-38). What Hokanson lacks with regard to claim 1 is a plurality of transmission line pins. However, it is well known in the art to include a number of devices within a single package and to include additional pins or contacts for controlling the devices. This practice is beneficial for example in that it can reduce overall

packaging costs, provide redundancy, or provide multiple wavelength sources in a single unit. Accordingly it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include more than one device (e.g. laser diode **52**) in the Hokanson package and to further include more than one corresponding transmission line pin.

Claims 2 and 3: Hokanson does not describe the cross-sectional shape of the pins in the alternative structure mentioned above. It would have been obvious to a skilled person to select an appropriate cross-sectional shape for the pins in order to meet prescribed requirements, e.g. for ease of manufacture or compatibility with existing pin receptacles.

Claim 8: Hokanson does not specify the dielectric material referred to at col. 4 line 37. However, PTFE is a commonly known insulative material (teflon) and has been used as the insulating sheath in conventional coaxial cable connectors. It would have been obvious to a skilled person to choose any suitable dielectric material, including PTFE, for use as the dielectric sheath for the pins in the Hokanson package.

Claim 9: It is considered inherent that the transmission line pins have an inner portion with an exposed inner conductor, since the electrical signals need to get out of the pins and into the optoelectronic devices. Note that Hokanson shows a wire bonded between an input line and the laser diode in fig. 5.

Claim 10: Similarly, it is asserted that the outer portions of the pins have exposed inner conductors since there must be an efficient way to get the external electrical signals into the pins.

Claims 17-18: There is a raised mount **54** in the cavity and an electro-optical device **52** on the raised mount (fig. 5).

Claim 20: The base **26** as disclosed does not have a flange with a mounting hole. However the recited mounting structure is already well known in the art. It would have been obvious to a person having ordinary skill in the art to modify the base **26** by extending it and providing a hole in order to facilitate attachment of the package to an external structure and to improve the heat transfer to the external structure since the base acts as a common heat sink for the package (col. 5 lines 28-35).

Claims 21-22: The package includes a thermoelectric cooler **50**, which fits into the cavity defined by the submount layers **18-22** and fits on the base (fig. 5).

Claim 23: The package includes an optical input receptacle **58**.

Claims 24-25: An optical ferrule is not disclosed. However, an optical fiber **56** enters the package via a flange **58**. It is well known in the art to provide ferrules to protect the ends of fibers. Accordingly it would have been obvious to a skilled person to provide a ferrule for fiber **56** in order to protect it from stresses associated with entrance and fixation to the package.

Claim 26: An electro-optical device **52** is included in the package, and is optically coupled to the fiber (col. 6 line 67 – col. 7 line 2).

Claims 30-32, 37-39, 47, 49-50, and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hokanson et al. in view of Kuwahara et al.

Claim 30: The Hokanson package modified as proposed above in relation to claim 1 meets the limitations of claim 30 except that the submount does not include barriers between adjacent transmission line pins. Kuwahara is similarly directed to the packaging of high frequency devices, and teaches that placing metallic barriers **17** between transmission line pins

14 improves the electrical characteristics of the package e.g. by providing impedance matching. Since Kuwahara is from the same field of endeavor and addresses a problem that is inherent in packages such as Hokanson's package, it would have been obvious to a skilled person to incorporate the barriers taught by Kuwahara into the submount layers of the Hokanson package in order to further improve the electrical properties of the Hokanson package.

Claims 31-32, 37-39, 47, 49-50, and 53-55: These claims contain limitations which parallel those of various claims rejected above under Hokanson taken alone, and are subject to the same grounds of rejection.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Allowable Subject Matter

Claims 14, 27-29, 40, 45, 48, 51-52, 67, 72, 75, and 78-79 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and if claims 15 and 19 are rewritten to overcome the objections above. Claims 15 and 19 would be allowable if

rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claim 14 requires that the cover has a plurality of shield walls, each coated with a conductive material. Neither Kuwahara nor Hokanson teach or suggest this feature in combination with the limitations of parent claim 1.

Claim 15 requires that the cover has a relief for receiving an optical input receptacle. Kuwahara and Hokanson both teach a contrary arrangement in that the optical input receptacle runs through the middle of a wall of the submount, and is not close enough to the cover to necessitate providing an accommodating relief in the cover.

Claim 19 requires that the optical input receptacle includes a half-moon shaped slot. None of the references of record teach or suggest such a feature.

Claim 27 requires an optical spacer that assists optical coupling. No such spacer is disclosed or suggested by the applied references. Claim 28 is allowable at least by dependence from claim 27.

Claims 29, 45, and 72 recite that the submount includes a plurality of external ground bumps disposed between the transmission line pins. This feature is not taught or suggested by the applied references.

Claim 40 requires that the cover includes a plurality of interior shield walls that align with the plurality of barriers. Neither Kuwahara nor Hokanson disclose such a feature, and they provide no suggestion that the existing barriers would need to be supplemented by interior shield walls in the cover.

Claims 48 and 75 recite that the base includes an insert molded thermally conductive plate. The applied references fail to teach or suggest such an element. Claims 51-52 and 78-79 are allowable at least by dependence from claims 48 and 75 respectively.

Claim 67 requires that the cover has a plurality of interior shield walls. This feature is not taught or suggested in Makiuchi.

Conclusion

The following references are cited on the attached PTO-892 form as they are considered pertinent to the disclosure: US 6663294 (issued on the parent application), US 6252726, US 6207950, US 4802178, JP 2001-237482.

Any inquiry concerning this communication should be directed to Mike Stahl at (571) 272-2360. Official communications which are eligible for submission by facsimile and which pertain to this application may be faxed to (703) 872-9306. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at (703) 308-0956 or to the technical support staff supervisor at (703) 308-3072.

MJS

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February 13, 2004